

# Louisiana State University Design Standards

## DIVISION 03 – CONCRETE

### 1 CONCRETE MATERIALS AND METHODS

- 1.1 All streets and driveways must meet state highway standards for design and construction, with a minimum width of 24 feet for two way traffic and 12 feet for one way traffic. Islands and any other physical barriers should not be employed to channelize traffic. Signage and other traffic control devices should conform to the most current Manual on Uniform Traffic Control Devices.
- 1.2 Plain and reinforced concrete work to comply with the current edition of the American Concrete Institute (ACI) publications, to the extent applicable in each reference.
- 1.3 Comply with current editions of the applicable American Society for Testing and Materials (ASTM) specifications, to the extent applicable in each reference.
- 1.4 Comply with current edition of the Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practices.

### 2 CONCRETE REINFORCEMENT

- 2.1 Reinforcing steel shall be ASTM-A615 deformed, billet-steel of grade 60 or better, and shall be installed in accordance with CRSI “Manual of Standard Practice for Reinforced Concrete Construction.”

### 3 CAST-IN PLACE CONCRETE

- 3.1 All concrete shall be a minimum of 3,000 p.s.i. in 28 days. Higher strength concrete and possible admixtures should be considered in special situations.
- 3.2 Aggregates
  - 3.2.1 Aggregates shall conform to provisions of ASTM C33
  - 3.2.2 Use coarse aggregate from only one source and fine aggregate from only one source for exposed concrete in a single structure.
  - 3.2.3 Select proportions of ingredients to produce a concrete having proper workability, durability, strength, and appearance. Proportion ingredients to produce a mixture that will work readily into corners and angles of forms and around reinforcement by methods of placing and consolidation employed on the project.
- 3.3 Field Quality Control
  - 3.3.1 Environmental Controls - Rinsing out of the transit mix trucks, washing or wetting of concrete, site cleanup, or other activity related to water at the site shall be in strict conformance with all EPA requirements for the prevention of water runoff to storm water sewers or ditches.
  - 3.3.2 Testing and Controls
    - 3.3.2.1 The Contractor shall be required to employ, at their expense, a commercial testing laboratory, acceptable to the Owner, to prepare and test the initial mix design for each class of concrete specified.
    - 3.3.2.2 Field Test Cylinders During Construction
      - 3.3.2.2.1 Mold four cylinders for each set of tests specified
      - 3.3.2.2.2 Test one specimen at 7 days and two at 28 days according to ASTM C39. If one or both of the 28-day tests indicate a compressive strength below the strength required, the fourth specimen shall be tested at 56 days. If all tests indicate a compressive strength below the strength required, the Architect/Engineer may, at their discretion, direct the Contractor to perform testing of in-place concrete at no additional cost to the Owner, regardless of the outcome of the tests.
    - 3.3.2.3 Testing of Deficient In-Place Concrete

- 3.3.2.3.1 Concrete strength will be considered potentially deficient if the averages of two consecutive sets of strength test results fail to equal or exceed the specified strength or if any individual strength test result falls below the specified strength or if any individual strength test result falls below the specified strength. Testing may be required as directed by the Architect/Engineer
- 3.3.2.3.2 Concrete work not having the required strength, as determined by the Architect/Engineer, shall be replaced at the Contractor's expense.
- 3.3.2.3.3 All costs incurred in providing the additional testing and/or analyses required as a result of deficient concrete shall be at the Contractor's expense. All costs as a result of delays due to additional testing and/or analyses will be at the Contractor's expense, with no extension of contract length, regardless of the outcome of the testing

#### 3.4 Acceptance of Concrete Work

- 3.4.1 Formed surfaces resulting in a configuration of members smaller than permitted under the tolerances specified shall be considered deficient and repaired or replaced as directed by the Architect/Engineer
  - 3.4.2 Concrete members cast in the wrong location shall be rejected if the strength, appearance, or function of the structure is, in the Architect/Engineer's opinion, adversely affected or if misplaced members interfere with other construction. If rejected, remove members cast in the wrong location and repair or replace the Contractor's expense as directed by the Architect/Engineer
- 3.5 All work required under this section shall be at the Contractor's expense, with no extension of contract time.